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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/937,831	11/28/2001	Shinya Yoshida	0033-0770P	5530

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT	PAPER NUMBER
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2652

DATE MAILED: 04/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/937,831

Applicant(s)

YOSHIDA ET AL.

Examiner

Peter Vincent Agustin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 5-7 and 9-12 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "43" on page 6, line 25. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors, e.g.,

Page 6, line 29: "have" should be --has--.

Claim 1, line 25: "first parallel plane" should be --first parallel planes--.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

5. Claim 1 objected to because it recites the limitation "said other first parallel plane" on lines 32-33, which lacks antecedent basis.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 5, 6 & 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. (hereafter Kobayashi) (US 5,621,714) in view of Yoshida et al. (hereafter Yoshida) (US 5,428,595) and Ando (US 5,272,685).

In regard to claim 1, Kobayashi discloses an optical pickup device (figure 24) comprising: a source of light (111); a lens (114) arranged on an optical path extending from said source of light to a magneto-optical recording medium (117); a beam splitter (112, 113 & 116) arranged on an optical path extending from said source of light to said lens, to separate a portion of light reflected by said magneto-optical recording medium; and a photodetector (115) detecting said reflected light separated by said beam splitter; wherein: said beam splitter includes a first member (112), reflecting light received from said source of light and directing the light to arrive at said magneto-optical recording medium, and passing a reflection of light received from said magneto-optical recording medium, and a second member (113) adjacent to said first member, and further passing light reflected from said magneto-optical recording medium past said first member; said first member is a prism having a parallelogramic cross section and having first parallel planes (112a & 112e) opposite each other and second parallel planes (112b & side opposite 112b) opposite each other and each traversing said first parallel planes at a predetermined angle, one of said first parallel planes (112e) being arranged in contact with said

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second member, one of said second parallel planes (112b) being arranged opposite said source of light, the other of said second parallel planes (side opposite 112b) being arranged opposite said lens; said predetermined angle is so selected that light output from said source of light and incident on said one second parallel plane at a predetermined angle of incidence, is reflected initially by said other first parallel plane (112a) and then by said one first parallel plane (112e) and emerges from said other second parallel plane (side opposite 112b); said photodetector (figure 26, element 115) includes a set of photodetection portions (121a & 121b) corresponding to a portion thereof divided in two by a boundary parallel to a plane orthogonal to said first and second parallel planes of said beam splitter. However, Kobayashi does not disclose a first diffraction element arranged on an optical path extending from said beam splitter to said photodetector, said first diffraction element is divided in two by a line parallel to a plane orthogonal to said first and second parallel planes of said beam splitter, to have first and second regions; and light reflected by said magneto-optical recording medium that is diffracted by said first region is directed to said boundary of said photo detection portions. Furthermore, Kobayashi is silent to whether the first member of the beam splitter is made of isotropic optical material and the second member of the beam splitter is made of anisotropic optical material.

Yoshida discloses a diffraction element (figure 5, element 20) divided in two by a line (DL) to have first (20a) and second (20b & 20c) regions; and light reflected by an magneto-optical recording medium (5) that is diffracted by said first region is directed to a boundary (figure 6, line BB) of photodetection portions (61b & 61c). Furthermore, in regard to claim 12, Yoshida (figure 6) discloses that outputs of said photodetection portions (61b & 61c) are compared with each other (49) to obtain a focus error signal (FES). It would have been

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obvious to one of ordinary skill in the art at the time of invention by the applicant to have added the diffraction element of Yoshida between the beam splitter and photodetector of Kobayashi, the motivation being to obtain a more accurate reading of a focus error signal, thereby minimizing recording/reproducing errors.

Ando (figure 1) discloses a beam splitter comprising a first member (4) made of isotropic optical material (column 4, line 10) and a second member (6) made of anisotropic optical material (column 4, line 9), in order to provide an optical head with reduced size. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have made the first and second members of Kobayashi with isotropic and anisotropic materials, respectively, the motivation being to provide an optical head with reduced size.

In regard to claim 5, Kobayashi discloses that the second member (figure 34, element 113) has a crystal axis selected to be orthogonal to light emerging from said other one of said second parallel planes and to form approximately 45° to a plane including a vector in a direction of the light emerging from said other one of said second parallel planes and a vector normal to said one of said first parallel planes (see column 19, lines 35-56).

In regard to claim 6, Kobayashi (figure 28) discloses an optically transparent substrate (130) arranged between said source of light and said photodetector, and said beam splitter. However, Kobayashi does not disclose that the optically transparent substrate is provided with a first diffraction element thereon.

(See description of Yoshida above). It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have provided the optically transparent substrate of Kobayashi with the diffraction element of Yoshida thereon, the motivation being to

obtain a more accurate reading of a focus error signal, thereby minimizing recording/reproducing errors.

8. Claims 2, 3 & 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Yoshida & Ando as applied to claim 1 above, and further in view of another embodiment of Kobayashi (hereafter Kobayashi₂).

For a description of Kobayashi, Yoshida & Ando, see the rejection above. However, neither Kobayashi, Yoshida nor Ando disclose that said first member has an index of refraction substantially equal to an extraordinary index of refraction of said second member (claim 2), that said first member has an index of refraction having a difference from an extraordinary index of refraction of the second member of no more than one half a difference between an ordinary index of refraction and said extraordinary index of refraction of said second member (claim 3), or that said second member has an index of refraction of 1.4 to 2.0.

In regard to claim 2, Kobayashi₂ discloses (figure 13) a beam splitter (85, 86 & 87) having a first member (85) with an index of refraction substantially equal to an extraordinary index of refraction of a second member (86) (see column 13, lines 43-45). In regard to claim 3, Kobayashi₂ (see column 13, lines 37-53) discloses that said first member has an index of refraction (ranging between 1.539 to 1.548) having a difference from an extraordinary index of refraction of the second member (1.548) of no more than one half a difference between an ordinary index of refraction and said extraordinary index of refraction of said second member ($0.5 \times (1.548 - 1.539) = 0.0045$). Note: choosing the lower range (1.539) yields a difference of 0.0045, and choosing the upper range (1.548) yields a difference of zero, which satisfies claim 3. In regard to claim 10, Kobayashi₂ discloses that said second member has an index of refraction

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of 1.539, which is between 1.4 and 2.0. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have selected the above mentioned values for the first and second members of Kobayashi, Yoshida & Ando, as suggested by Kobayashi₂, the motivation being to reduce astigmatism and coma resulting from differences in reflective indices.

9. Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Yoshida & Ando as applied to claims 1 & 6 above, and further in view of Hayashi et al. (hereafter Hayashi) (US 5,790,504).

For a description of Kobayashi, Yoshida & Ando, see the rejection above. However, neither Kobayashi, Yoshida nor Ando disclose a second diffraction element arranged in said optically transparent substrate at a position to receive light output from said source of light, to divide the light received from said source of light into at least three beams of light.

Hayashi (figure 1) discloses a diffraction element (22) arranged in an optically transparent substrate (21) at a position to receive light output from a source of light (17), to divide the light received from said source of light into at least three beams of light. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have added the diffraction element of Hayashi to the device of Kobayashi, Yoshida & Ando, the motivation being to obtain a more accurate reading of a focus error signal, thereby minimizing recording/reproducing errors (see column 6, line 32).

10. Claim 9 rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Yoshida & Ando as applied to claims 1 & 6 above, and further in view of Yanagawa et al. (hereafter Yanagawa) (US 6,266,313).

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For a description of Kobayashi, Yoshida & Ando, see the rejection above. However, neither Kobayashi, Yoshida nor Ando disclose a $\frac{1}{2}$ wave plate arranged between said source of light and said beam splitter.

Yanagawa (figure 1) discloses a $\frac{1}{2}$ wave plate (12) arranged between a source of light (11) and a beam splitter (40). It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have added the $\frac{1}{2}$ wave plate of Yanagawa between the source of light and beam splitter of Kobayashi, Yoshida & Ando, the motivation being to obtain optimum light detection, thereby enabling more accurate optical recording/reproduction.

11. Claim 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi, Yoshida & Ando as applied to claims 1 & 10 above, and further in view of Komatsu et al. (hereafter Komatsu) (JP 10101486 A).

For a description of Kobayashi, Yoshida & Ando, see the rejection above. However, neither Kobayashi, Yoshida nor Ando disclose that said second member is formed of lithium tetraborate.

Komatsu (see solution) discloses a beam splitter being made of a lithium tetraborate crystal. It would have been obvious to one of ordinary skill in the art at the time of invention by the applicant to have formed the second member of Kobayashi, Yoshida & Ando with lithium tetraborate, as suggested by Komatsu, the motivation being to provide a wide transparent region to wavelengths of the laser beam and high threshold value of light damage.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Matsuoka et al. (US 5,517,480), Ichikawa et al. (US 5,412,633), Endo et al. (US 5,416,755) and Kadowaki et al. (US 6,654,336) all disclose beam splitters having two adjacent parallelogramic prisms.

Lee et al. (US 5,537,384) and Compaan (US 4,464,741) disclose focus error detectors having beam splitters with multiple prisms.

Allowable Subject Matter

13. Claim 8 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter:

In regard to claim 8, no prior art of record alone or in combination discloses or suggests an optical pickup device comprising: a source of light; a lens; a beam splitter including first member and second member made of isotropic and ^{anisotropic} isotropic material, respectively, first member being a parallelogramic prism; a photodetector; an optically transparent substrate provided with a first divided diffraction element and a second diffraction element, and further wherein said **first and second diffraction elements are juxtaposed on a single plane.**

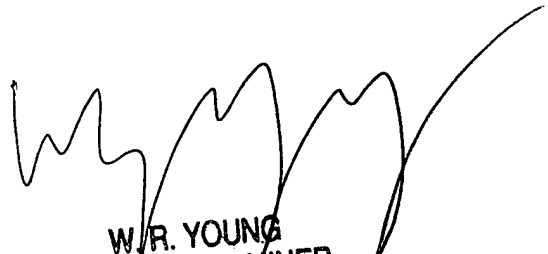
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent Agustin whose telephone number is (703) 305-8980. The examiner can normally be reached on Monday thru Friday 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PVA
04/08/2004



W.R. YOUNG
PRIMARY EXAMINER